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REMARKS

Claims 1 - 20 are pending in the present application.

In section 3 of the Office Action, claims 1 - 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants amended claim 9 so that all of its terms have a proper antecedent basis. Reconsideration and withdrawal of the section 112 rejection are respectfully solicited.

In sections 5 - 7 of the Office Action, the claims are rejected under 35 U.S.C. 103(a) as being unpatentable over various combinations of the following U.S. Patents:

- (a) US 5,436,723 to Kunselman et al. (hereinafter "the Kunselman et al. patent");
- (b) US. 5,880,777 to Savoye et al. (hereinafter "the Savoye et al. patent"); and
- (c) US 6,256,090 to Chen et al. (hereinafter "the Chen et al. patent").

More specifically,

- (a) in section 5, claims 1, 7, 8 and 20 are rejected as being unpatentable over the Kunselman et al. patent in view of the Savoye et al. patent;
- (b) in section 6, claims 2 - 6 are rejected as being unpatentable over the Kunselman et al. patent as modified by the Savoye et al. patent, and further in view of the Chen et al. patent; and
- (c) in section 7, claims 9 - 19 are rejected as being unpatentable over the Kunselman et al. patent as modified by the Savoye et al. and Chen et al. patents.

Applicants note that sections 6 and 7 of the Office Action also refer to "Crawford", which Applicants assume to mean U.S. Patent No. 5,343,289 to Crawford et al. (hereinafter "the Crawford et al. patent."), as cited in an office action dated 14 AUG 2002. However, as none of the rejections are introduced as being based on an application of the Crawford et al. patent, and as the Office Action does not include a citation to any specific passage or figure in the Crawford et al. patent, Applicants are assuming that the references to "Crawford" are made in error.

The present application contains 3 independent claims, namely claims 1, 9 and 20. Claims 1 and 20 are amended to recite “a flexible sensor array ... having a surface with a shape corresponding to said focal surface”, and claim 9 is amended to recite “a flexible sensor array formed to a shape of said focal surface”. Below, Applicants explain that none of the aforementioned references describe or suggest a flexible sensor array as recited in claims 1, 9 and 20.

Claim 1 provides for an optical device. The device includes, (a) an imaging device for imaging an incident beam onto a focal surface, (b) a support element having a surface with a shape corresponding to the focal surface, the surface of the support element being located on the focal surface, and (c) a flexible sensor array in close contact with the surface of the support element and having a surface with a shape corresponding to the focal surface.

Section 6 of the Office Action, at page 4, lines 1 - 4, appears to acknowledge that the Kunselman et al. and Savoye et al. patents do not teach a flexible structure having an array of sensors, and so, introduces the Chen et al. patent.

The Chen et al. patent describes a method and apparatus for determining the shape of a flexible body by utilizing sensors positioned along the flexible body. For example, FIG. 2 of the Chen et al. patent shows fiber optic measurement nodes 24 along a body 22 (col. 6, line 47). The sensors are Bragg grating sensors (col. 1, lines 13 - 18), and more specifically, in-fiber Bragg gratings (FBG) (col. 4, lines 23 - 55). The operating principal of the in-fiber Bragg grating is explained with reference to Fig. 3(a) which shows an optical fiber core 32 with an in-fiber Bragg grating 36. Light from a broadband source 38 interacts with grating 36 (col. 5, lines 2 - 4). Light that interacts with grating 36 is represented by a solid horizontal arrow in Fig. 3(a). Thus, in the Chen et al. patent, the light from source 38 is incident on an end of fiber core 32.

Page 4 of the Office Action suggests that the fiber optic measuring nodes 24 are descriptive of an array of sensors, and that body 22 is descriptive of a flexible structure. **Light would apparently be directed into, and thus be incident on, an end of body 22, and so, a configuration of nodes 24 along body 22 does not have a shape corresponding to a focal**

surface. Consequently, the configuration of nodes 24 along body 22 does not describe or suggest a flexible sensor array ... having a surface with a shape corresponding to said focal surface, as recited in claim 1.

Additionally, page 4 of the Office Action states, "it would have been obvious ... to substitute the CCD image substrate of Savoye with the flexible structure having sensors of Chen ..." However, Applicants respectfully disagree. Page 3 of the Office Action states, "Savoye teaches a CCD image substrate (208) serving as a sensor array is mounted on a support element (208) [sic] ..." The Savoye et al. patent, at col. 28, line 64 - col. 29, line 4 states:

As shown in FIG. 12B, the input light 12 is here directed through the simple single lens, and then directed immediately to a curved CCD imager 206 in which the CCD imager substrate 208 is positioned on an appropriately curved support substrate 210. This enables imaging of a large field of view by the imaging system of the invention using only lightweight and simple optical input elements.

The sensors of the Chen et al. patent use Bragg grating sensor technology for producing a plurality of strain measurements along a fiber path (Abstract). Applicants do not believe that producing a plurality of strain measurements along a fiber path as described by the Chen et al. patent, would enable imaging of a large field of view, as the Savoye et al. patent desires of CCD image substrate 208. **The proposed modification would render the Savoye et al. patent unsatisfactory for its intended purpose,** and as such, the proposed combination of the Savoye et al. and Chen et al. patents cannot be employed for the purpose of a section 103 rejection of claim 1.

As the Office Action has apparently recognized, the Kunselman et al. and Savoye et al. patents neither describe nor suggest a flexible sensor array, as recited in claim 1. Thus, claim 1 is patentable over the Kunselman et al. and Savoye et al. patents.

Furthermore, as explained above, the Chen et al. patent does not describe or suggest a flexible sensor array ... having a surface with a shape corresponding to said focal surface, as recited in claim 1, and so, the Chen et al. patent does not make up for the deficiency of the Kunselman et al. and Savoye et al. patents. Also, the proposed combination of the Savoye et al.

and Chen et al. patents is not proper for the purpose of a section 103 rejection of claim 1. For these reasons, claim 1 is patentable over all of the Kunselman et al., Savoye et al. and Chen et al. patents, whether these patents are considered alone or in combination.

Independent claim 9 also provides for an optical device. The optical device includes a flexible sensor array formed to a shape of a focal surface. As explained above, the Kunselman et al. and Savoye et al. patents do not describe a flexible sensor array, and whereas the Chen patent describes an in-fiber Bragg grating where light is incident on the end of a fiber core, it neither describes nor suggests imaging a beam on a focal surface ... and a flexible sensor array formed to a shape of said focal surface, as recited in claim 9. Additionally, as explained above in support of claim 1, the proposed combination of the Savoye et al. and Chen et al. patents would render the Savoye et al. patent unsatisfactory for its intended purpose, and thus, the proposed combination cannot be employed for the purpose of a section 103 rejection of claim 9.

Independent claim 20 includes a recital similar to that of claim 1. As such, for reasons similar to that of claim 1, claim 20 is patentable over the Kunselman et al., Savoye et al. and Chen et al. patents, whether these patents are considered alone or in combination.

Claims 2 - 8 depend from claim 1, and claims 10 - 19 depend from claim 9. As such, claims 2 - 8 and 10 - 19 are patentable over the references for at least the same reasons as are independent claims 1 and 9.

Applicants respectfully request reconsideration and withdrawal of the section 103(a) rejections of (i) claims 1, 7, 8 and 20, (ii) claims 2 - 6, and (iii) claims 9 - 19.

Applicants amended claims 1 and 20 to clarify a feature of the sensor array that is neither described nor suggested by the references. Applicants amended claims 9 and 13 to provide a proper antecedent basis for all terms.

In view of the foregoing, Applicants respectfully submit that all claims presented in this application patentably distinguish over the prior art. Accordingly, Applicants respectfully request favorable consideration and that this application be passed to allowance.

Respectfully submitted,

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